

ANETIA JAEGERI, DANAUS CLEOPHILE AND
LYCOREA CLEOBAEA FROM JAMAICA
(NYMPHALIDAE: DANAINAE)

R. I. VANE-WRIGHT AND P. R. ACKERY

Department of Entomology, The Natural History Museum, Cromwell Road,
London SW7 5BD, United Kingdom

AND

T. TURNER

Department of Zoology, Division of Lepidoptera Research, University of Florida,
Gainesville, Florida 32604

ABSTRACT. Two species of danaid butterflies, *Anetia jaegeri* Ménétriés and *Lycorea cleobaea* Godart, are documented from Jamaica, West Indies, for the first time. The status of a third, *Danaus cleophile* Godart, is reviewed. The biogeographic implications of these species' occurrence on Jamaica are discussed in the context of Caribbean biogeography.

Additional key words: Hispaniola, Cuba, biogeography, vicariance, distribution.

This paper comments on three rare milkweed butterflies (Danainae) from Jamaica, including the first formal records of the genera *Anetia* and *Lycorea* from the island, and speculates on the presence of a second, possibly new species of *Anetia*. Biogeographic implications of the new discoveries are briefly discussed.

Anetia jaegeri Ménétriés

The genus *Anetia* Hübner, once considered to be the most primitive of milkweed butterflies (Forbes 1939), comprises five montane or sub-montane species distributed in three areas: Central America (*A. thirza* Geyer), Cuba (*A. cubana* Salvin, *A. briarea* Godart, *A. pantheratus* Martyn), and Hispaniola (*A. jaegeri*, *A. briarea*, *A. pantheratus*). For many years there has been speculation that *Anetia* also occurs on Jamaica. Based on sightings made by several naturalists, Brown and Heineman (1972) concluded that "it seems possible that there is a species . . . on Jamaica that awaits capture and will probably be found to represent another member in the *cubana-jaegeri* complex."

The Natural History Museum (BMNH, London) recently has received a male *Anetia jaegeri* labelled 'Jamaica, Christiana, Aug. 21 1960.' Christiana lies almost exactly at the center of the island, in the south-western part of the Dry Harbour Mountains, at over 1200 m altitude. The terrain is characterized by pine plantations on the higher hilltops, cultivated ridges, and dense scrub in intervening ravines. This new specimen differs from males of nominate *A. jaegeri*, formerly known only from Hispaniola, by having slightly more extensive yellow mark-

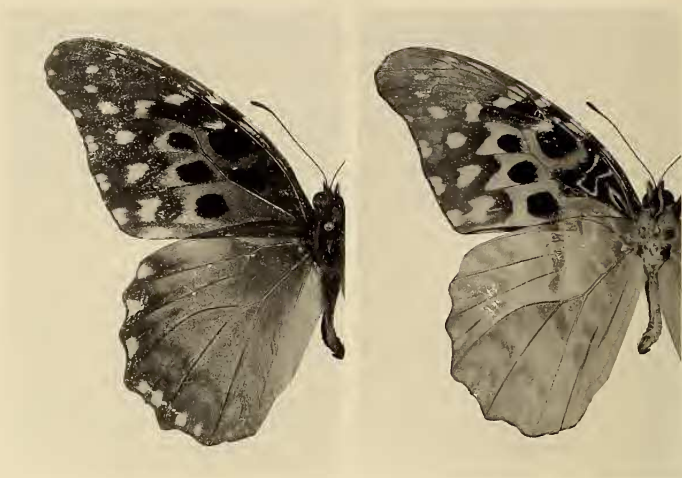


FIG. 1. *Anetia jaegeri*, male, from Christiana, Jamaica, 21.viii. 1960; forewing length 41 mm.; dissection 1773A. Dorsal surface on left, ventral on right.

ings. The wing pattern (Fig. 1) of this individual is thus more similar to that of Hispaniola females rather than males. The genitalia are the same as Hispaniolan *jaegeri*.

A second male specimen, with exactly the same data written in the same hand, is held in the University of Florida collection, Gainesville, Florida. In this case the upperside is almost identical to Hispaniolan males, notably in the size of the yellow spots. On the underside hind-wing, the brown markings are reduced or absent, with only the vertical bar, which extends from the anterior wing margin to the end of the discal cell, remaining prominent. Compared to Hispaniola males in the BMNH collection, this appears to represent one extreme of the normal variation in wing-marking intensity. The relatively fresh wing condition of both specimens, and the collection of more than one specimen on the same day, suggest that *A. jaegeri* is a resident species in central Jamaica.

Danaus cleophile Godart

Danaus (Danaus) cleophile is a second danaine butterfly thought to occur only on Hispaniola and Jamaica. A relatively little-known insect, it is the sister-species of the monarch butterflies (*Danaus (Danaus) plexippus* L. and *D. (D.) erippus* Cramer), and may thus prove to be of great significance in relation to many current speculations about the monarch (see Malcolm & Zalucki 1992).

Danaus cleophile was last collected in Jamaica by Avinoff and Schoumatoff on Mount Diablo, in 1941, in ravines where waterfalls occurred.

As waterfalls are not found on the most well-known part of Mount Diablo, between Evarton and Moneague, the precise locality needs to be re-discovered. Repeated searches in the Hollymount area of Mount Diablo, as recently as June 1992, have been unsuccessful.

Lycorea cleobaea Godart

The second danaine formally recorded from Jamaica for the first time is *Lycorea cleobaea cleobaea*. This is the same subspecies as found on Hispaniola and Puerto Rico, and distinct from *L. c. demeter* Felder and Felder from Cuba (with occasional strays in southern Florida), and the various subspecies of Central and South America. It was first found on Jamaica as larvae feeding on *Carica papaya* L. (Caricaceae), in southwest Kingston, by A. Garel. A single female, which emerged on 2 February 1974, is held in the Institute of Jamaica collection, Kingston. Adults have been seen in xeric regions of southwest Kingston as recently as October 1990, by D. Hopwood. This insect also occurs in xeric habitats in Haiti (Schwartz 1983).

Biogeography

According to Ackery and Vane-Wright (1984), *A. jaegeri* is the sister species of *A. cubana*, and these two together form the sister group to *A. thirza*. The discovery of *A. jaegeri* on Jamaica might thus suggest, on a vicariance hypothesis, that Jamaica and Hispaniola have a more recent history of connection to each other than either has to Cuba. However, Ackery and Vane-Wright (1984) also regarded *A. jaegeri* as a "paraspecies" (cf. "metaspecies" of de Queiroz & Donoghue 1988) because *A. jaegeri* lacks a diagnostic autapomorphy in relation to *A. cubana* and *A. thirza*. On this evidence, the two populations of *A. jaegeri* must be treated as a paraphyletic group, with the implication that one or the other (rather than both together) could form the true sister group of *A. cubana*. Thus, any idea of a special relationship between Hispaniola and Jamaica could not be directly supported by the evidence of *A. jaegeri*.

As *D. cleophile*, also restricted to Hispaniola and Jamaica, is regarded as a cladistically definable species (Ackery & Vane-Wright 1984), this might give credence to a special relationship between the two islands (cf. Miller & Miller 1989) and raise the expectation of eventually finding uniquely defining characteristics for *A. jaegeri* itself. We have no information on the possible monophyly of the Hispaniolan and Jamaican populations of *Lycorea cleobaea cleobaea*. The nominate subspecies extends to Puerto Rico but, as indicated above, the Cuban population of *L. cleobaea* is phenotypically distinct.

Liebherr (1988) has investigated the biogeography of West Indian

carabid beetles of the genus *Platynus*, demonstrating strong links between Hispaniola, Cuba, Jamaica, and Central America. Over the last 50 million years Cuba and Hispaniola may have undergone a complex sequence of fusions and separations, but Jamaica appears to have been separate (but sometimes closer to Hispaniola than now) throughout this period (Liebherr 1988, also see Miller & Miller 1989). Such a scenario provides a ready explanation for *Anetia jaegeri* as a paraspecies, but does not help us to understand the distribution of *Danaus cleophile*. Has *D. cleophile* never occurred on Cuba, has it gone extinct there, or has it simply been overlooked? The new Jamaican records of *Anetia* and *Lycorea* reported here, and the failure to find *D. cleophile* on Jamaica for over 50 years, make the last two possibilities more likely.

As an alternative to a vicariance hypothesis, we could consider dispersal. Darlington (1957) suggested that frogs of the genus *Hyla* entered the Greater Antilles from the Honduras region, reaching Jamaica first, then Hispaniola, and finally Cuba. Such a dispersal route would provide an explanation for both the limited distribution of *Danaus cleophile* and the paraphyly of *A. jaegeri* in relation to *A. cubana*—but there is no compelling reason to single out this particular route in preference to others.

Yet Another Jamaican Danaine?

Before such questions or speculations are pursued on existing evidence, more direct exploration is required. With the addition of *Anetia jaegeri* and *Lycorea cleobaea* to the Jamaican list, the number of milkweed butterflies positively recorded from the island has risen to six (the others being *Danaus cleophile*, *D. eresimus* Cramer, *D. gilippus* Cramer and *D. plexippus*). However, since 1948 there have been several accounts of a large, dark, unidentified butterfly in the mountains of eastern Jamaica, which appear to indicate the existence of a seventh danaine. Brown and Heineman (1972) concluded that the butterfly must be an *Anetia*, but a much darker species than *A. jaegeri*, more like the very distinctive *A. cubana*.

For example, Lewis (1949) reported that in June 1948 Coleman Goin of the University of Florida described a "fairly large, dark butterfly, apparently black with a distinct yellow border along the margin of both fore and hind wings" near the summit of Blue Mountain Peak. On 8 July 1948 Lewis sighted a "large, apparently black butterfly, with a wing spread of nearly four inches" and "a yellow border around the outer edges of both pairs of wings," at Cinchona, several miles to the west of Blue Mountain Peak. Bengry (1949) notes that on 22 April 1949 McCord sighted a butterfly above Mavis Bank, south of Cinchona, which was "black with white and yellow borders on all wings."



FIG. 2. Known distribution of *Anetia jaegeri* (solid circles) in central Jamaica, and the locations of sightings of a darker, *Anetia*-like insect in eastern Jamaica (open symbols) (see also text).

On 2 July 1967, Turner saw a large dark brown or sooty black insect, with pale yellow submarginal bands on both wings, crossing the track one mile north of Barretts Gap on the way to Corn Puss Gap, several miles east of the earlier sightings. On 2 August 1968 a similar insect was observed by Turner, two miles south of Corn Puss Gap, flying 15 ft high in a forest clearing, where it was observed for several minutes. The butterfly was dark brown to sooty black, about four inches in wingspan, and with a clearly visible falcate apex to the forewing. Seen from beneath, the submarginal band on the forewing was pale yellow and broader and more continuous than that of *A. cubana*. The submarginal marking of the hindwing was not opaque like that of the forewing, and was difficult to discern from below.

Both flight pattern and wing markings were superficially similar to the endemic *Papilio homerus* Fabricius, but the unidentified insect was smaller and lacked tails. There was no similarity in flight to either *Papilio pelaus* Fabricius or *Battus polydamas* L., both of which were seen in the vicinity. The eastern localities in which these sightings have been made include habitats with elevations from approximately 450–2250 m, in or adjacent to cloud forest. The distributions of *A. jaegeri* and the unidentified *Anetia*-like insect from eastern Jamaica are shown in Fig. 2.

As Cuba and Hispaniola both harbor three species of *Anetia*, is it possible that there could be two, or even more species on Jamaica? If a form of *A. cubana* is confirmed to occur there in addition to *A. jaegeri*, the biogeographical challenge presented by *Anetia* would become even more interesting.

A concerted effort to rediscover *Anetia* in Jamaica would seem well worthwhile. A search is already in progress (including attempts to relocate *Danaus cleophile*) through Turner's *Caribbean Wildlife Surveys*. Recent advances in our knowledge of the biology of the previously obscure *Anetia* butterflies (Schwartz 1989, Ivie et al. 1990, Ackery in prep.) surely will increase the chances of success.

A key step will involve discovery of the early stages and re-confirmation of the hostplant. DeVries (1987) notes *Metastelma* (Asclepiadaceae) as a possible host for *Anetia thirza* in Costa Rica, while Keith Brown (pers. comm.) knows of *Anetia* having been bred on *Cynanchum* (= *Metastelma* = *Vincetoxicum*) in Cuba, Dominican Republic, Costa Rica, and El Salvador. This suggests likely hosts to be *Cynanchum leptocladum* for *A. jaegeri* in central Jamaica, and *C. fawcetti* or *C. harrisii* for eastern *Anetia* species.

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